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10/648,785	08/27/2003	Joeri Lof	081468-0305473	4480

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EXAMINER

KO, TONY

ART UNIT PAPER NUMBER

2878

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/648,785

Applicant(s)

LOF ET AL.

Examiner

Tony Ko

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 1-12, 17-24 is/are allowed.  
6) ☒ Claim(s) 13-16 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 5, 7, 17, 20, 21-24, are rejected under 35 U.S.C. 102(b) as being anticipated by Moriyama (U.S. Patent 4,798,470).

3. Regarding claims 1, 5, 7, and 17, Moriyama discloses (Fig. 8) an alignment tool, comprising: a substrate table (111) configured to hold a substrate (101) having a substrate mark (103), wherein the substrate mark may be at a different level from the rest of the surface of the substrate; and an alignment system (Fig. 11) configured to detect alignment between a reference mark (115) and the substrate mark (103) using an alignment beam of radiation, wherein an optical element (104) is removably positionable in the path of the alignment beam to adjust the focal plane of the alignment system to focus on the substrate mark at a different level from the rest of the surface of the substrate. Moriyama also discloses the alignment system comprises a projection system (129) and the optical element is placed in the path of the alignment beam directly after the alignment system. Moriyama also discloses a front-to-backside alignment optics configured to direct the alignment beam to the back of the substrate and in which the optical element is placed on the entrance to the front-to-back side alignment optics (Fig. 8). Moriyama also discloses the optical element comprises a

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plurality of optical elements removably positionable in the path of the alignment beam such that one or more (104) may be simultaneously in the path of the alignment beam.

4. Regarding claims 22-24, Moriyama discloses projecting an alignment beam of radiation onto a substrate mark (103) provided on a substrate (101), wherein the substrate mark may be at a different level from the rest of the surface of the substrate; and adjusting the focal plane of the alignment beam to focus on the substrate mark at a different level from the rest of the surface of the substrate by interposing an optical element into the alignment beam while detecting alignment.

5. Regarding claims 20 and 21, Moriyama also discloses a lithographic projection apparatus, comprising: a radiation system configured to provide a beam of radiation; a support configured to support a patterning device, the patterning device (114) configured to pattern the beam of radiation according to a desired pattern; a projection system (127) configured to project the patterned beam onto a target portion (102) of a substrate (101); and an alignment tool including a substrate table (111) configured to hold the substrate (131) having a substrate mark (103), wherein the substrate mark (103) may be at a different level from the rest of the surface of the substrate; and an alignment system configured to detect alignment between a reference mark (115) and the and the substrate mark (103) using an alignment beam of radiation, wherein an optical element is removably positionable in the path of the alignment beam to adjust the focal plane of the alignment system to focus on the substrate mark at a different level from the rest of the surface of the substrate. Moriyama also discloses the alignment beam traverses at least part of the projection system.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 4, 6, 8, 9-12, 18, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriyama (U.S. Patent 4,798,470).

8. Regarding claim 3, Moriyama discloses the invention set forth above, Moriyama does not disclose to adjust the focal plane of the alignment system by up to 2mm. It is design choice to adjust the focal plane up to 2mm. It would have been obvious to a person of ordinary skill in the art at the time of the invention to adjust the focal plane by up to 2mm to accommodate for different substrate sizes.

9. Regarding claim 4, Moriyama discloses the invention set forth above, and Moriyama does not disclose adjust the alignment system by at least 0.1mm. It is design choice to adjust the alignment system by at 0.1mm. It would have been obvious to a person of ordinary skill in the art at the time of the invention to adjust the focal plane by at least 0.1 mm to accommodate for different substrate sizes.

10. Regarding claim 6, Moriyama discloses the invention set forth above; Moriyama does not disclose the optical element is attached to the substrate table. It is design choice to attach the optical element to the substrate table. It would have been obvious to a person of ordinary skill in the art at the time of the invention to attach the optical

element to the substrate table to ensure the optical element is on the focal point of the alignment beam.

11. Regarding claim 8, Moriyama discloses the invention set forth above; Moriyama does not disclose the optical element along the projection beam is altered to adjust the focal plane of the alignment beam. It is well known to adjust the optical element to adjust and focus a beam of light. It would have been obvious to a person of ordinary skill in the art at the time of the invention to alter the optical element to adjust the focal plane of an alignment beam to precisely focus the light beam.

12. Regarding claims 18 and 19, Moriyama discloses the invention set forth above, Moriyama does not disclose moving the focal plane of the alignment system in a direction that is perpendicular or parallel to the direction of propagation of the alignment beam. It is well known to adjust the focal plane of the alignment system in a direction that is perpendicular or parallel to the direction of propagation of the alignment to adjust to the different thicknesses of the wafers.

13. Claims 2, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriyama (U.S. Patent 4,798,470) in view of Omata (U.S. Patent 4,616,130).

14. Regarding claim 2, Moriyama discloses the invention set forth above; Moriyama does not disclose the use of a plane plate. Omata discloses the use of a plane plate (6a). It would have been obvious to a person of ordinary skill in the art at the time of the invention to use a plane plate to achieve the desired refraction angle.

15. Regarding claims 9-11, Moriyama discloses the invention set forth above; Moriyama does not disclose the optical element comprises a plurality of interchangeable

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optical elements. Omata discloses (Fig. 1) the optical element comprises a plurality of interchangeable optical elements (6a, 6b) with different thickness (different optical property). It would have been obvious to a person of ordinary skill in the art at the time of the invention to use interchangeable optical elements with different thicknesses for the system to function properly with wafer of different thicknesses.

16. Regarding claim 12, Moriyama in view of Omata discloses the invention set forth above; Moriyama in view Omata does not disclose to vary the refractive indices. It is well known to vary the refractive indices of the optical elements. It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize optical elements with different refractive indices to accurately adjust for the different wafers.

### ***Allowable Subject Matter***

17. Claims 13-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Prior art discloses the invention set forth above, prior art does not teach the optical element being hollow and filled with fluid being adjustable to change the refractive index of the optical element.

### ***Response to Arguments***

18. Applicant's arguments filed 6/21/05 have been fully considered but they are not persuasive. Applicant argues that Moriyama does not disclose an optical element removably positionable. It is understood that removable means to change the location, position, station, or residence and positionable means an act of placing or arranging. Moriyama discloses the elements recited in the application are removably positionable. As shown in the drawings in the application, Moriyama discloses the optical element being removably positionable. That is, the optical element can be removed from its current location and placed as shown in Fig. 8. Thus, Moriyama clearly anticipates the limitation applicant argued as allowable.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Ko whose telephone number is 571-272-1926. The examiner can normally be reached on Monday-Friday 7:30 - 4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TKO



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